

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference UMO10008-3	FOR FURTHER ACTION <div style="text-align: right;">see Form PCT/ISA/220 as well as, where applicable, item 5 below.</div>	
International application No. PCT/US2011/023520	International filing date (<i>day/month/year</i>) 02 FEBRUARY 2011 (02.02.2011)	(Earliest) Priority Date (<i>day/month/year</i>) 02 FEBRUARY 2010 (02.02.2010)
Applicant THE CURATORS OF THE UNIVERSITY OF MISSOURI et al		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☒ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (See Box No. III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 5
- ☒ as suggested by the applicant.
- ☐ as selected by this Authority, because the applicant failed to suggest a figure.
- ☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figure is to be published with the abstract.

International application No.
PCT/US2011/023520

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

- Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/023520**A. CLASSIFICATION OF SUBJECT MATTER***A61L 27/38(2006.01)i, A61F 2/04(2006.01)i, C12N 5/071(2010.01)i, C12N 5/0775(2010.01)i, A61L 27/54(2006.01)i, C12N 5/02(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61L 27/38; G06T 7/40; A61F 2/36; C07K 14/46; C12Q 1/00; C12N 5/06; A61F 2/06; A61K 45/00; A61M 37/00; A61F 2/44

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: multicellular, construct, cell, graft, acellular, channel, dimension, axon

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004-0219133 A1 (LYLES MARK B.) 04 November 2004 See abstract: claims 1-20.	1-7, 22-27, 44-48 , 60-63, 79-83 , 98-100, 109-115 , 133-155
A	US 2007-0142916 A1 (STANLEY OLSON et al.) 21 June 2007 See abstract: claims 1-20.	1-7, 22-27, 44-48 , 60-63, 79-83 , 98-100, 109-115 , 133-155
A	EP 2090584 A1 (MAX-PLANCK-GESELLSCHAFT ZUR FORDERUNG DER WISSENSCHAFTEN E.V.) 19 August 2009 See claims 1-18.	1-7, 22-27, 44-48 , 60-63, 79-83 , 98-100, 109-115 , 133-155
A	US 2007-0231787 A1 (MARK A. VOELKER) 04 October 2007 See abstract: claims 1-21.	1-7, 22-27, 44-48 , 60-63, 79-83 , 98-100, 109-115 , 133-155



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

31 OCTOBER 2011 (31.10.2011)

Date of mailing of the international search report

31 OCTOBER 2011 (31.10.2011)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/023520

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0248145 A1 (CHAN BEE ENG et al.) 01 October 2009 See abstract; claims 1-25.	1-7, 22-27, 44-48 .60-63, 79-83 .98-100, 109-115 .133-155
A	Valerie Liu Tsang et al. Advanced Drug Delivery Reviews 2004, Vol.56, pp.163 5-1647. See whole document.	1-7, 22-27, 44-48 .60-63, 79-83 .98-100, 109-115 .133-155

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/023520

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004-0219133 A1	04.11.2004	US 7641898 B2 WO 2004-084828 A2 WO 2004-084828 A3 WO 2004-084828 A3	05.01.2010 07.10.2004 12.05.2005 07.10.2004
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US 2009-0248145 A1	01.10.2009	None	